

~~~~~ *Series 1*

## WOOFERS

S1-408

S1-808

S1-410

S1-810

S1-412

S1-812

S1-415

S1-815

## OWNER'S MANUAL



Dear Customer,

*Congratulations on your purchase of America's finest brand of car audio components. At Rockford Fosgate we are committed to musical reproduction at its best, and we are pleased you chose our product. Through years of engineering expertise, hand craftsmanship and critical testing procedures we have created a wide range of products that reproduce music with all the clarity and richness you deserve.*

*For maximum performance we recommend you have your new Rockford Fosgate product installed by an Authorized Rockford Fosgate Dealer, as we provide specialized training through Rockford Technical Training Institute (RTTI). Please read your warranty and retain your receipt and original carton for possible future use.*

*To add the finishing touch to your new Rockford Fosgate image order your Rockford accessories, which include everything from T-shirts and jackets to hats and sunglasses.*

*To get a free brochure on Rockford Fosgate products and Rockford accessories, please call 1-800-669-9899 or FAX 1-800-398-3985 in the U.S. For Canada, call Korbon Trading at 905-567-1920. For international orders FAX 001-1-602-967-8132 or call 001-1-602-967-3565.*

#### **PRACTICE SAFE SOUND™**

CONTINUOUS EXPOSURE TO SOUND PRESSURE LEVELS OVER 100dB MAY CAUSE PERMANENT HEARING LOSS. HIGH POWERED AUTO SOUND SYSTEMS MAY PRODUCE SOUND PRESSURE LEVELS WELL OVER 130dB. USE COMMON SENSE AND PRACTICE SAFE SOUND.

If, after reading your manual, you still have questions regarding this product, we recommend that you see your Rockford Fosgate dealer. If you need further assistance, you can call us direct at 1-800-795-2385. Be sure to have your serial number, model number and date of purchase available when you call.

The serial number can be found on the outside of the box. Please be sure to record it in the space provided below as your permanent record. This will become useful in recovering your product if ever stolen and serve as verification of your factory warranty.

Serial Number: \_\_\_\_\_

Model Number: \_\_\_\_\_

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# **SERIES 1 WOOFER CONTENTS**

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Series 1 Woofer  
Owner's Manual

## **INTRODUCTION**

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This manual contains information on the construction, installation and operation of the Series 1 low frequency speakers. We recommend you keep this manual for future reference.

The Series 1 Woofers are a full line of low frequency drivers ranging in size from 8" to 15" in diameter. System compatibility is ensured by offering each size at four and eight ohm impedance. Designed to offer Rockford Fosgate quality in an affordable speaker, the Series 1 Woofers offer the beginning car stereo enthusiast an opportunity to enjoy solid low frequency music reproduction. Our engineers have selected materials and techniques used in building our speakers which offer performance and reliability comparable to other speakers selling for much more.

## **DESIGN FEATURES**

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The following section describes the methods used in constructing the Series 1 Woofers and how each was optimized.

**Black Anodized Aluminum Voice Coil Former** – To improve the reliability of the voice coil, it is wound on a black, anodized aluminum former. Because aluminum is an efficient thermal conductor, it keeps heat from concentrating in the voice coil during normal use.

**Vented Pole Piece** – To allow operation at reasonably high power levels, ventilation is needed. This is done through the use of a vented pole piece. The venting allows fresh air to circulate and remove the built up heat from the voice coil assembly.

**PVA Treated Paper Cone** – The cone is constructed from a light-weight, rigid paper material. The cone is treated with Polyvinyl Acetate which lowers the resonance and reduces distortion. The PVA also reduces damage from the harsh environmental conditions typical of a car interior.

**Suspension** – The suspension of a speaker is the part of the speaker which controls the motion of the cone. This is what changes the electrical energy to sound energy. The surround is constructed from a dual laminated foam which ensures linear motion of the cone while resisting mechanical and environmental damage.

**Dual Input Terminals** – To facilitate hook-up in multiple driver configurations, each positive and negative terminal has two connecting lugs. **The positive terminal is identified by a dot which also indicates the speaker's impedance.** A red dot is used on a 8Ω speaker, a violet dot on a 4Ω speaker.

## **LOW FREQUENCY SPEAKER SYSTEMS**

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The Series 1 Woofers require an enclosure to achieve optimum results. The enclosure allows the speaker to operate at lower frequencies with improved power handling. The two most commonly used types of low frequency speaker systems are acoustic suspension and bass reflex. The acoustic suspension enclosure, commonly referred to as a sealed box, relies upon the changing air pressure in a tightly sealed chamber of its operation. The bass reflex, commonly referred to as a ported enclosure, uses a vent inserted into the box which takes over for the speaker at a desired frequency which is determined by the internal volume of the enclosure and the size of the vent used. The Series 1 Woofer will yield optimum performance in a ported enclosure.

## **USING THE SERIES 1 WOOFERS**

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Speakers are built in different sizes to optimize their performance in different frequency bands. Crossovers are used to route the different frequency bands for each appropriate speaker. There are two operational types of crossover: active and passive. An active crossover is an electronic filter which is placed before the amplifier and separates the signal fed to different amplifiers in the system. A passive crossover is positioned after the amplifier and separates the signal fed to each speaker in the system. Active crossovers offer the accuracy and flexibility needed for a sophisticated system and are used in complex multiple amp designs. Passive crossovers (capacitors and inductors) allow the use of multiple speakers in a simple system which can easily be expanded over time. We recommend using a 6dB per octave, 100Hz low-pass crossover for the Series 1 Woofers when used with a passive system.

To customize the installation, try adjusting the crossover point one octave up or down to optimize the system staging.

## CALCULATING LOAD IMPEDANCE

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The Series 1 Woofers are used for the sub-bass region, those frequencies below 100Hz. This is the foundation for the music and the frequency range you feel. Before selecting the passive crossover, it is necessary to calculate the load impedance of the speaker system. In a series circuit the impedance is determined by the formula:

$$R_T = R_1 + R_2 + R_3 \dots$$

In a parallel circuit the impedance is determined by the formula:

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \dots$$

Where  $R_T$  is the total speaker load and  $R_1$ ,  $R_2$ , etc. represent each speaker in the system.

The crossover is connected in line to the positive terminal of the speaker system. The crossovers are available from Authorized Rockford Fosgate Dealers.

## CALCULATING VOLUME

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Calculating volume is merely a matter of measuring the dimensions in inches and using the formula: Volume = Height x Width x Depth. The result is in cubic inches. Convert this to cubic feet by dividing by 1,728 (the number of cubic inches in a cubic foot). If two facing sides are of uneven length, add them together and divide by two to get the average. Using this number will give you the volume without the necessity of calculating the box in sections and adding the sections together. The thickness of the baffle material determines the internal volume. The speaker itself also reduces the internal volume. The amount of air displaced by each model is listed on the specification sheet and should also be subtracted from the gross volume calculation.

# **BUILDING AN ENCLOSURE**

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To work properly, the walls of the enclosure must be rigid and not flex when subjected to the high pressures generated by the speaker's operation. We recommend using 3/4" thick high density particle board or medium density fiberboard (MDF), which are available at most building supply stores. For a large box, internal bracing is needed for reinforcement. The joints should be glued, using non-flammable carpenter's glue, and secured with either nails or screws. Internally the joints should be sealed with silicon to prevent air from leaking. Because the high density particle board and MDF are porous materials, it is suggested to seal the outside enclosure walls with polyurethane. Ideally, the port should be located on the same face as the speaker and positioned at least one port diameter away from the side and back walls.

## **In Conclusion**

Special care has been taken to ensure your satisfaction with the Series 1 Woofers. The materials and workmanship have been carefully selected to guarantee performance equal to the needs of the most demanding conditions. If you have any further questions or advanced system needs, your Authorized Rockford Fosgate Dealer will be happy to assist you.

# SPECIFICATIONS

| Model                       | S1-408      | S1-808      | S1-410      | S1-810      | S1-412      | S1-812      | S1-415        | S1-815        |
|-----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|---------------|
| Norm. Impedance             | 4           | 8           | 4           | 8           | 4           | 8           | 4             | 8             |
| FS (Hz)                     | 40          | 42          | 36          | 38          | 28          | 29          | 26            | 27            |
| RE (Ohm)                    | 3.5         | 6.9         | 3.4         | 6.8         | 3.4         | 6.7         | 3.4           | 6.7           |
| LE (mH)                     | 1.49        | 2.40        | 1.47        | 2.25        | 1.43        | 2.22        | 1.71          | 2.87          |
| QMS                         | 4.02        | 2.90        | 3.75        | 3.81        | 3.41        | 4.11        | 4.89          | 3.90          |
| QES                         | 0.35        | 0.37        | 0.40        | 0.42        | 0.36        | 0.45        | 0.49          | 0.59          |
| QTS                         | <b>0.32</b> | <b>0.33</b> | <b>0.36</b> | <b>0.38</b> | <b>0.33</b> | <b>0.41</b> | <b>0.44</b>   | <b>0.51</b>   |
| VAS (cu.ft)                 | <b>1.06</b> | <b>1.06</b> | <b>2.40</b> | <b>2.40</b> | <b>6.57</b> | <b>6.57</b> | <b>11.336</b> | <b>11.336</b> |
| VAS (liter)                 | 30          | 30          | 68          | 68          | 186         | 186         | 321           | 321           |
| Power (Watts RMS)           | <b>100</b>  | <b>100</b>  | <b>100</b>  | <b>100</b>  | <b>100</b>  | <b>100</b>  | <b>150</b>    | <b>150</b>    |
| Power (Watts Peak)          | <b>200</b>  | <b>200</b>  | <b>200</b>  | <b>200</b>  | <b>200</b>  | <b>200</b>  | <b>300</b>    | <b>300</b>    |
| SPL (dB @ 1w/1m)            | <b>89</b>   | <b>89</b>   | <b>91</b>   | <b>91</b>   | <b>92</b>   | <b>92</b>   | <b>93</b>     | <b>93</b>     |
| X-MAX (inches)              | <b>0.19</b> | <b>0.19</b> | <b>0.20</b> | <b>0.20</b> | <b>0.20</b> | <b>0.20</b> | <b>0.23</b>   | <b>0.23</b>   |
| X-MAX (mm)                  | 4.7         | 4.7         | 5.2         | 5.2         | 5.1         | 5.1         | 5.9           | 5.9           |
| Rec. Tuning Frequency       | 40Hz        | 40Hz        | 35Hz        | 35Hz        | 35Hz        | 35Hz        | 35Hz          | 35Hz          |
| Port Diameter (in.)         | 2           | 2           | 3           | 3           | 4           | 4           | 4             | 4             |
| Port Length (in.)           | 3-3/4       | 3-3/4       | 8           | 8           | 10-3/4      | 10-3/4      | 4             | 4             |
| Rec. Box Vol. (cu. ft.)     | 1           | 1           | 1.5         | 1.5         | 2           | 2           | 4             | 4             |
| Spk. Dis. Outside (cu. ft.) | 0.03        | 0.03        | 0.04        | 0.04        | 0.05        | 0.05        | 0.107         | 0.107         |
| Spk. Dis. Inside (cu. ft.)  | 0.04        | 0.04        | 0.06        | 0.06        | 0.08        | 0.08        | 0.145         | 0.145         |
| Mntng. Dia. (in.)           | 7-1/8       | 7-1/8       | 9-1/4       | 9-1/4       | 11          | 11          | 14            | 14            |
| Mntng. Depth (in.)          | 3-2/3       | 3-2/3       | 3-29/32     | 3-29/32     | 4-4/5       | 4-4/5       | 6-3/32        | 6-3/32        |



# WARRANTY INFORMATION

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Rockford Fosgate warrants all loudspeakers to the original purchaser for a period of two (2) years parts and labor, providing the product was purchased from an Authorized Rockford Fosgate Dealer. Speakers found to be defective during the warranty period will be repaired or replaced (with a product deemed to be equivalent) at Rockford Fosgate's discretion. **Repaired or replaced speakers will cover the balance of the original warranty period only.** Warranty applies only to original purchaser and is non-transferable. Warranty does not cover abuse or installation error. If a determination is made that the product has been abused or is out of the warranty period, it will be repaired, exchanged, and billed. Parts not covered under warranty will be repaired or replaced and billed. For speaker boxes, please return the speaker only. Serial number must be intact to obtain warranty. Speakers must be returned prepaid to Grand Rapids, Michigan.

## GENERAL

Electronics and speaker warranties do not cover any appearance item, any cost or expense related to the removal or reinstallation of the product, any accessory used in conjunction with the product, damage to the product resulting from alteration, accident, misuse or abuse, or improper installation. This warranty does not apply if the parts or labor, which would otherwise be provided without charge under this warranty, are obtained from any source other than Rockford Fosgate or an Authorized Rockford Fosgate Service Center.

The warranty is the only express warranty and does not create any implied warranties. Rockford Fosgate limits its obligations under any implied warranties under state laws to a period not to exceed the written warranty period. Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply. This warranty applies only to products sold in the United States of America or its possessions. For warranty outside the U.S.A., please contact the nearest Authorized Rockford Fosgate Dealer. This warranty gives the consumer specific legal rights, and the consumer may have other rights which vary from state to state.

A defective product must be shipped prepaid to the Authorized Rockford Fosgate Dealer from which the consumer purchased the product or to the address below, in the original factory carton or equivalent. Any shipping loss or damage will be borne by the consumer or the consumer's shipper. **A consumer returning a product to the factory should call (800) 669-9899 for a Return Authorization Number.** All shipments shall be clearly marked with the Return Authorization Number on the outside of the shipping carton.

Rockford Corporation  
609 Myrtle N.W.  
Grand Rapids, MI 49504 (Receiving-speakers)

# **NOTES**

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**Rockford Fosgate**  
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